

Client Side Classes

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Class HTTPJDBCCallableStatement

```

package com.VSDV.HTTPJDBC.Client;

import java.sql.*;
import java.util.*;
import java.math.*;

import com.VSDV.HTTPJDBC.Common.*;

/**
 * LFRT class implementing java.sql.CallableStatement
 */
public class HTTPJDBCCallableStatement extends HTTPJDBCPreparedStatement
implements CallableStatement {

    public HTTPJDBCCallableStatement(HTTPJDBCConnection con, String objectName,
Object[] parameters) {
        super(con, parameters);
    }

    public void initializeStatement(HTTPJDBCConnection con, Object[] parameters){
        InObject defaultMethodObject = new InObject(con.getName(), "", parameters, true);
        defaultMethodObject.setMethod("prepareCall");
        addToMethodList(defaultMethodObject);
    }

    public void registerOutParameter(int parameterIndex, int sqlType) throws
SQLException {
        InObject inObject = new InObject(objectName, "registerOutParameter", new Object[]
{new Integer(parameterIndex), new Integer(sqlType) }, false );
        addToMethodList(inObject);
    }

    public void registerOutParameter(int parameterIndex, int sqlType, int scale) throws
SQLException {
        InObject inObject = new InObject(objectName, "registerOutParameter", new Object[]
{new Integer(parameterIndex), new Integer(sqlType), new Integer(scale) } ,false);
        addToMethodList(inObject);
    }

    public boolean wasNull() throws SQLException {
        Boolean b = (Boolean)session.call(objectName, "wasNull" , true);
        return b.booleanValue();
    }
}

```

```

public String getString(int parameterIndex) throws SQLException {
    return (String)session.call(objectName, "getString", new Object[] {new
Integer(parameterIndex) }, true);
}

public boolean getBoolean(int parameterIndex) throws SQLException {
    Boolean b = (Boolean)session.call(objectName, "getBoolean", new Object[] {new
Integer(parameterIndex) }, true );
    return b.booleanValue();
}

public byte getByte(int parameterIndex) throws SQLException {
    Byte b = (Byte)session.call(objectName, "getByte", new Object[] {new
Integer(parameterIndex) }, true );
    return b.byteValue();
}

public short getShort(int parameterIndex) throws SQLException {
    Short b = (Short)session.call(objectName, "getShort", new Object[] {new
Integer(parameterIndex) }, true );
    return b.shortValue();
}

public int getInt(int parameterIndex) throws SQLException {
    Integer b = (Integer)session.call(objectName, "getInt", new Object[] {new
Integer(parameterIndex) }, true );
    return b.intValue();
}

public long getLong(int parameterIndex) throws SQLException {
    Long b = (Long)session.call(objectName, "getLong", new Object[] {new
Integer(parameterIndex) }, true );
    return b.longValue();
}

public float getFloat(int parameterIndex) throws SQLException {
    Float b = (Float)session.call(objectName, "getFloat", new Object[] {new
Integer(parameterIndex) }, true );
    return b.floatValue();
}

public double getDouble(int parameterIndex) throws SQLException {
    Double b = (Double)session.call(objectName, "getDouble", new Object[] {new
Integer(parameterIndex) }, true);
    return b.doubleValue();
}

```

```

    }

    public BigDecimal getBigDecimal(int parameterIndex, int scale) throws SQLException
    {
        return (BigDecimal)session.call(objectName, "getBigDecimal", new Object[] {new
Integer(parameterIndex), new Integer(scale) }, true);
    }

```

```

    public byte[] getBytes(int parameterIndex) throws SQLException {
        return (byte[])session.call(objectName, "getBytes", new Object[] {new
Integer(parameterIndex) }, true);
    }

```

```

    public java.sql.Date getDate(int parameterIndex) throws SQLException {
        return (java.sql.Date)session.call(objectName, "getDate", new Object[] {new
Integer(parameterIndex) }, true );
    }

```

```

    public java.sql.Time getTime(int parameterIndex) throws SQLException {
        return (java.sql.Time)session.call(objectName, "getTime", new Object[] {new
Integer(parameterIndex) }, true );
    }

```

```

    public java.sql.Timestamp getTimestamp(int parameterIndex) throws SQLException {
        return (java.sql.Timestamp)session.call(objectName, "getTimestamp", new Object[]
{new Integer(parameterIndex) }, true);
    }

```

```

    public Object getObject(int parameterIndex) throws SQLException {
        return session.call(objectName, "getObject", new Object[] {new
Integer(parameterIndex) }, true );
    }

```

//-----JDBC 2.0-----

```

    public BigDecimal getBigDecimal(int parameterIndex) throws SQLException {
        return (BigDecimal)session.call(objectName, "getBigDecimal", new Object[] {new
Integer(parameterIndex) }, true);
    }

```

```

    public Object getObject (int i, java.util.Map map) throws SQLException {
        return (Object)session.call(objectName, "getObject", new Object[] {map}, true );
    }

```

```

    public Ref getRef (int i) throws SQLException {
        return (Ref)session.call(objectName, "getRef", new Object[] {new Integer(i) }, true );
    }

```

```

    }

    public Blob getBlob (int i) throws SQLException {
        return (Blob)session.call(objectName, "getBlob", new Object[] {new Integer(i) }
,true);
    }

    public Clob getClob (int i) throws SQLException {
        return (Clob)session.call(objectName, "getClob", new Object[] {new Integer(i) }
,true);
    }

    public Array getArray (int i) throws SQLException {
        return (Array)session.call(objectName, "getArray", new Object[] {new Integer(i) },true
);
    }

    public java.sql.Date getDate(int parameterIndex, Calendar cal)
        throws SQLException {
        return (java.sql.Date)session.call(objectName, "getDate", new Object[] {new
Integer(parameterIndex), cal } ,true);
    }

    public java.sql.Time getTime(int parameterIndex, Calendar cal)
        throws SQLException {
        return (java.sql.Time)session.call(objectName, "getTime", new Object[] {new
Integer(parameterIndex), cal } ,true );
    }

    public java.sql.Timestamp getTimestamp(int parameterIndex, Calendar cal)
        throws SQLException {
        return (java.sql.Timestamp)session.call(objectName, "getTimestamp", new Object[]
{new Integer(parameterIndex), cal } ,true);
    }

    public void registerOutParameter (int paramIndex, int sqlType, String typeName)
throws SQLException {
        InObject inObject = new InObject(objectName, "registerOutParameter", new Object[]
{new Integer(paramIndex), new Integer(sqlType), typeName } ,false);
        addToMethodList(inObject);
    }
}

```

Class HTTPJDBCConnection

```
package com.VSDV.HTTPJDBC.Client;
```

```
import java.sql.*;
import java.util.*;
```

```
import com.VSDV.HTTPJDBC.Common.*;
```

```
/**
```

```
 * LFRT class implementing java.sql.Connection
 */
```

```
public class HTTPJDBCConnection extends JDBCStub implements Connection {
```

```
    HTTPJDBCSession session;
    boolean closed, isReadOnly;
```

```
    public HTTPJDBCConnection(HTTPJDBCSession session, String objectName) {
        super(objectName); // This names the object name
        this.session = session; // Each conneciton is assigned to a HTTPJDBCSESSION
        closed = false;
    }
```

```
    public String makeTestCall() throws SQLException {
        return (String)session.call("testobject", "testMethod", true);
    }
```

```
    public void clearWarnings() throws SQLException {
        session.call(objectName, "clearWarnings", false);
    }
```

```
    public void close() throws SQLException {
        session.call(objectName, "close", false);
        closed = true;
    }
```

```
    public void commit() throws SQLException {
        session.call(objectName, "commit", false );
    }
```

```
    public boolean getAutoCommit() throws SQLException {
        Boolean b = (Boolean)session.call(objectName, "getAutoCommit", true );
        return b.booleanValue();
    }
```

```
    public String getCatalog() throws SQLException {
```

```

    return (String)session.call(objectName, "getCatalog", true);
}

public DatabaseMetaData getMetaData() throws SQLException {
    String n = (String)session.call(objectName, "getMetaData", true);
    HTTPJDBCDatabaseMetaData stmt = new HTTPJDBCDatabaseMetaData(this, n);
    return stmt;
}

public int getTransactionIsolation() throws SQLException {
    Integer i = (Integer)session.call(objectName, "getTransactionIsolation", true);
    return i.intValue();
}

public SQLWarning getWarnings() throws SQLException {
    return (SQLWarning)session.call(objectName, "getWarnings", true);
}

public Statement createStatement() throws SQLException {
    HTTPJDBCStatement stmt = new HTTPJDBCStatement(this);
    return stmt;
}

public boolean isClosed() throws SQLException {
    return closed;
}

public boolean isReadOnly() throws SQLException {
    return isReadOnly;
}

public String nativeSQL(String sql) throws SQLException {
    return (String)session.call(objectName, "nativeSQL", new Object[] {sql}, true );
}

public CallableStatement prepareCall(String sql) throws SQLException {
    HTTPJDBCCallableStatement stmt = new HTTPJDBCCallableStatement(this,
null, new Object[] {sql});
    return stmt;
}

public PreparedStatement prepareStatement(String sql) throws SQLException {
    HTTPJDBCPreparedStatement stmt = new HTTPJDBCPreparedStatement(this,
new Object[] {sql});
    return stmt;
}

```

```

public void rollback() throws SQLException {
    session.call(objectName, "rollback", false);
}

public void setAutoCommit(boolean autoCommit) throws SQLException {
    session.call(objectName, "setAutoCommit", new Object[] {new
Boolean(autoCommit)}, false );
}

public void setCatalog(String catalog) throws SQLException {
    session.call(objectName, "setCatalog", new Object[] {catalog}, false );
}

public void setReadOnly(boolean readOnly) throws SQLException {
    session.call(objectName, "setReadOnly", new Object[] {new
Boolean(readOnly)}, false );
}

public void setTransactionIsolation(int level) throws SQLException {
    session.call(objectName, "setTransactionIsolation", new Object[] {new
Integer(level)}, false );
}

HTTPJDBCSession getHTTPJDBCSession() { return session; }

public Statement createStatement(int resultSetType, int resultSetConcurrency) throws
SQLException {
    return null;
}

public PreparedStatement prepareStatement(String sql, int resultSetType, int
resultSetConcurrency) throws SQLException {
    return null;
}

public CallableStatement prepareCall(String sql, int resultSetType, int
resultSetConcurrency) throws SQLException {
    return null;
}

public void setTypeMap(Map map) throws SQLException { }

public Map getTypeMap() throws SQLException {
    return null;
}

```



```
public String getSessionID(){
    return session.getID();
}

public void finalize(){
    System.out.println("Closing connection");
    try{
        if (!isClosed()){
            close();
        }
    } catch(SQLException sqle){
        sqle.printStackTrace();
    }
}
```

Class HTTPJDBCDatabaseMetadata

```

package com.VSDV.HTTPJDBC.Client;

import java.sql.*;

import com.VSDV.HTTPJDBC.Common.*;

public class HTTPJDBCDatabaseMetaData extends JDBCStub implements
DatabaseMetaData {

    private HTTPJDBCSession session;
    private HTTPJDBCConnection connection;

    public HTTPJDBCDatabaseMetaData(HTTPJDBCConnection connection, String
objectName) {
        super(objectName);
        this.connection = connection;
        session = connection.getHTTPJDBCSession();
    }

    public boolean allProceduresAreCallable() throws SQLException{
        return ((Boolean)session.call(objectName, "allProceduresAreCallable",
true)).booleanValue();
    }

    public boolean allTablesAreSelectable() throws SQLException{
        return ((Boolean)session.call(objectName, "allTablesAreSelectable",
true)).booleanValue();
    }

    public String getURL() throws SQLException{
        return (String)session.call(objectName, "getURL", true);
    }

    public String getUser_name() throws SQLException{
        return (String)session.call(objectName, "getUser_name", true);
    }

    public boolean isReadOnly() throws SQLException{
        return ((Boolean)session.call(objectName, "isReadOnly", true)).booleanValue();
    }

    public boolean nullsAreSortedHigh() throws SQLException{

```

```

        return ((Boolean)session.call(objectName, "nullsAreSortedHigh",
true)).booleanValue();
    }

    public boolean nullsAreSortedLow() throws SQLException{
        return ((Boolean)session.call(objectName, "nullsAreSortedLow",
true)).booleanValue();
    }

    public boolean nullsAreSortedAtStart() throws SQLException{
        return ((Boolean)session.call(objectName, "nullsAreSortedAtStart",
true)).booleanValue();
    }

    public boolean nullsAreSortedAtEnd() throws SQLException{
        return ((Boolean)session.call(objectName, "nullsAreSortedAtEnd",
true)).booleanValue();
    }

    public String getDatabaseProductName() throws SQLException{
        return (String)session.call(objectName, "getDatabaseProductName", true);
    }

    public String getDatabaseProductVersion() throws SQLException{
        return (String)session.call(objectName, "getDatabaseProductVersion", true);
    }

    public String getDriverName() throws SQLException{
        return (String)session.call(objectName, "getDriverName", true);
    }

    public String getDriverVersion() throws SQLException{
        return (String)session.call(objectName, "getDriverVersion", true);
    }

    public int getDriverMajorVersion(){
        return 1;
    }

    public int getDriverMinorVersion(){
        return 0;
    }

    public boolean usesLocalFiles() throws SQLException{
        return ((Boolean)session.call(objectName, "usesLocalFiles",
true)).booleanValue();
    }

```

```

    }

    public boolean usesLocalFilePerTable() throws SQLException{
        return ((Boolean)session.call(objectName, "usesLocalFilePerTable",
true)).booleanValue();
    }

    public boolean supportsMixedCaseIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsMixedCaseIdentifiers",
true)).booleanValue();
    }

    public boolean storesUpperCaseIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName, "storesUpperCaseIdentifiers",
true)).booleanValue();
    }

    public boolean storesLowerCaseIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName, "storesLowerCaseIdentifiers",
true)).booleanValue();
    }

    public boolean storesMixedCaseIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName, "storesMixedCaseIdentifiers",
true)).booleanValue();
    }

    public boolean supportsMixedCaseQuotedIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName,
"supportsMixedCaseQuotedIdentifiers", true)).booleanValue();
    }

    public boolean storesUpperCaseQuotedIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName, "storesLowerCaseIdentifiers",
true)).booleanValue();
    }

    public boolean storesLowerCaseQuotedIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName, "storesUpperCaseQuotedIdentifiers",
true)).booleanValue();
    }

    public boolean storesMixedCaseQuotedIdentifiers() throws SQLException{
        return ((Boolean)session.call(objectName, "storesMixedCaseQuotedIdentifiers",
true)).booleanValue();
    }

```

```

    public String getIdentifierQuoteString() throws SQLException{
    return (String)session.call(objectName, "getIdentifierQuoteString", true);
    }

    public String getSQLKeywords() throws SQLException{
    return (String)session.call(objectName, "getSQLKeywords", true);
    }

    public String getNumericFunctions() throws SQLException{
    return (String)session.call(objectName, "getNumericFunctions", true);
    }

    public String getStringFunctions() throws SQLException{
    return (String)session.call(objectName, "getStringFunctions", true);
    }

    public String getSystemFunctions() throws SQLException{
    return (String)session.call(objectName, "getSystemFunctions", true);
    }

    public String getTimeDateFunctions() throws SQLException{
    return (String)session.call(objectName, "getTimeDateFunctions", true);
    }

    public String getSearchStringEscape() throws SQLException{
    return (String)session.call(objectName, "getSearchStringEscape", true);
    }

    public String getExtraNameCharacters() throws SQLException{
    return (String)session.call(objectName, "getExtraNameCharacters", true);
    }

    public boolean supportsAlterTableWithAddColumn() throws SQLException{
    return ((Boolean)session.call(objectName, "storesLowerCaseIdentifiers",
true)).booleanValue();
    }

    public boolean supportsAlterTableWithDropColumn() throws SQLException{
    return ((Boolean)session.call(objectName, "supportsAlterTableWithAddColumn",
true)).booleanValue();
    }

    public boolean supportsColumnAliasing() throws SQLException{
    return ((Boolean)session.call(objectName, "supportsColumnAliasing",
true)).booleanValue();

```

```

    }

    public boolean nullPlusNonNullIsNull() throws SQLException{
        return ((Boolean)session.call(objectName, "nullPlusNonNullIsNull",
true)).booleanValue();
    }

    public boolean supportsConvert() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsConvert",
true)).booleanValue();
    }

    public boolean supportsConvert(int fromType, int toType) throws
SQLException{
        return ((Boolean)session.call(objectName, "supportsConvert",
true)).booleanValue();
    }

    public boolean supportsTableCorrelationNames() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsTableCorrelationNames",
true)).booleanValue();
    }

    public boolean supportsDifferentTableCorrelationNames() throws
SQLException{
        return ((Boolean)session.call(objectName,
"supportsDifferentTableCorrelationNames", true)).booleanValue();
    }

    public boolean supportsExpressionsInOrderBy() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsExpressionsInOrderBy",
true)).booleanValue();
    }

    public boolean supportsOrderByUnrelated() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsOrderByUnrelated",
true)).booleanValue();
    }

    public boolean supportsGroupBy() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsGroupBy",
true)).booleanValue();
    }

    public boolean supportsGroupByUnrelated() throws SQLException{

```

```

        return ((Boolean)session.call(objectName, "supportsGroupByUnrelated",
true)).booleanValue();
    }

    public boolean supportsGroupByBeyondSelect() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsGroupByBeyondSelect",
true)).booleanValue();
    }

    public boolean supportsLikeEscapeClause() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsLikeEscapeClause",
true)).booleanValue();
    }

    public boolean supportsMultipleResultSets() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsMultipleResultSets",
true)).booleanValue();
    }

    public boolean supportsMultipleTransactions() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsMultipleTransactions",
true)).booleanValue();
    }

    public boolean supportsNonNullableColumns() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsNonNullableColumns",
true)).booleanValue();
    }

    public boolean supportsMinimumSQLGrammar() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsMinimumSQLGrammar",
true)).booleanValue();
    }

    public boolean supportsCoreSQLGrammar() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsCoreSQLGrammar",
true)).booleanValue();
    }

    public boolean supportsExtendedSQLGrammar() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsExtendedSQLGrammar",
true)).booleanValue();
    }

    public boolean supportsANSI92EntryLevelSQL() throws SQLException{

```

```

        return ((Boolean)session.call(objectName, "supportsANSI92EntryLevelSQL",
true)).booleanValue();
    }

```

```

    public boolean supportsANSI92IntermediateSQL() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsANSI92IntermediateSQL",
true)).booleanValue();
    }

```

```

    public boolean supportsANSI92FullSQL() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsANSI92FullSQL",
true)).booleanValue();
    }

```

```

    public boolean supportsIntegrityEnhancementFacility() throws SQLException{
        return ((Boolean)session.call(objectName,
"supportsIntegrityEnhancementFacility", true)).booleanValue();
    }

```

```

    public boolean supportsOuterJoins() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsOuterJoins",
true)).booleanValue();
    }

```

```

    public boolean supportsFullOuterJoins() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsFullOuterJoins",
true)).booleanValue();
    }

```

```

    public boolean supportsLimitedOuterJoins() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsLimitedOuterJoins",
true)).booleanValue();
    }

```

```

    public String getSchemaTerm() throws SQLException{
        return (String)session.call(objectName, "getSchemaTerm", true);
    }

```

```

    public String getProcedureTerm() throws SQLException{
        return (String)session.call(objectName, "getProcedureTerm", true);
    }

```



```

    }

    public String getCatalogTerm() throws SQLException{
    return (String)session.call(objectName, "getCatalogTerm", true);
    }

    public boolean isCatalogAtStart() throws SQLException{
    return ((Boolean)session.call(objectName, "isCatalogAtStart",
true)).booleanValue();
    }

    public String getCatalogSeparator() throws SQLException{
    return (String)session.call(objectName, "getCatalogSeparator", true);
    }

    public boolean supportsSchemasInDataManipulation() throws SQLException{
    return ((Boolean)session.call(objectName,
"supportsSchemasInDataManipulation", true)).booleanValue();
    }

    public boolean supportsSchemasInProcedureCalls() throws SQLException{
    return ((Boolean)session.call(objectName, "supportsSchemasInProcedureCalls",
true)).booleanValue();
    }

    public boolean supportsSchemasInTableDefinitions() throws SQLException{
    return ((Boolean)session.call(objectName, "supportsSchemasInTableDefinitions",
true)).booleanValue();
    }

    public boolean supportsSchemasInIndexDefinitions() throws SQLException{
    return ((Boolean)session.call(objectName, "supportsSchemasInIndexDefinitions",
true)).booleanValue();
    }

    public boolean supportsSchemasInPrivilegeDefinitions() throws SQLException{
    return ((Boolean)session.call(objectName,
"supportsSchemasInPrivilegeDefinitions", true)).booleanValue();
    }

    public boolean supportsCatalogsInDataManipulation() throws SQLException{

```

```

        return ((Boolean)session.call(objectName,
"supportsCatalogsInDataManipulation", true)).booleanValue();
    }

```

```

        public boolean supportsCatalogsInProcedureCalls() throws SQLException{
            return ((Boolean)session.call(objectName, "supportsCatalogsInProcedureCalls",
true)).booleanValue();
        }

```

```

        public boolean supportsCatalogsInTableDefinitions() throws SQLException{
            return ((Boolean)session.call(objectName, "supportsCatalogsInTableDefinitions",
true)).booleanValue();
        }

```

```

        public boolean supportsCatalogsInIndexDefinitions() throws SQLException{
            return ((Boolean)session.call(objectName, "supportsCatalogsInIndexDefinitions",
true)).booleanValue();
        }

```

```

        public boolean supportsCatalogsInPrivilegeDefinitions() throws SQLException{
            return ((Boolean)session.call(objectName,
"supportsCatalogsInPrivilegeDefinitions", true)).booleanValue();
        }

```

```

        public boolean supportsPositionedDelete() throws SQLException{
            return ((Boolean)session.call(objectName, "supportsPositionedDelete",
true)).booleanValue();
        }

```

```

        public boolean supportsPositionedUpdate() throws SQLException{
            return ((Boolean)session.call(objectName, "supportsPositionedUpdate",
true)).booleanValue();
        }

```

```

        public boolean supportsSelectForUpdate() throws SQLException{
            return ((Boolean)session.call(objectName, "supportsSelectForUpdate",
true)).booleanValue();
        }

```

```

    public boolean supportsStoredProcedures() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsStoredProcedures",
true)).booleanValue();
    }

```

```

    public boolean supportsSubqueriesInComparisons() throws SQLException{
        return ((Boolean)session.call(objectName,
"supportsSubqueriesInComparisons",true)).booleanValue();
    }

```

```

    public boolean supportsSubqueriesInExists() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsSubqueriesInExists",
true)).booleanValue();
    }

```

```

    public boolean supportsSubqueriesInIns() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsSubqueriesInIns",
true)).booleanValue();
    }

```

```

    public boolean supportsSubqueriesInQuantifieds() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsSubqueriesInQuantifieds",
true)).booleanValue();
    }

```

```

    public boolean supportsCorrelatedSubqueries() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsCorrelatedSubqueries",
true)).booleanValue();
    }

```

```

    public boolean supportsUnion() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsUnion",
true)).booleanValue();
    }

```

```

    public boolean supportsUnionAll() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsUnionAll",
true)).booleanValue();
    }

```

```

    public boolean supportsOpenCursorsAcrossCommit() throws SQLException{

```

```

        return ((Boolean)session.call(objectName,
"supportsOpenCursorsAcrossCommit", true)).booleanValue();
    }

```

```

        public boolean supportsOpenCursorsAcrossRollback() throws SQLException{
            return ((Boolean)session.call(objectName,
"supportsOpenCursorsAcrossRollback", true)).booleanValue();
        }

```

```

        public boolean supportsOpenStatementsAcrossCommit() throws SQLException{
            return ((Boolean)session.call(objectName,
"supportsOpenStatementsAcrossCommit", true)).booleanValue();
        }

```

```

        public boolean supportsOpenStatementsAcrossRollback() throws SQLException{
            return ((Boolean)session.call(objectName,
"supportsOpenStatementsAcrossRollback", true)).booleanValue();
        }

```

```

        public int getMaxBinaryLiteralLength() throws SQLException{
            return ((Integer)session.call(objectName, "getMaxBinaryLiteralLength",
true)).intValue();
        }

```

```

        public int getMaxCharLiteralLength() throws SQLException{
            return ((Integer)session.call(objectName, "getMaxCharLiteralLength",
true)).intValue();
        }

```

```

        public int getMaxColumnNameLength() throws SQLException{
            return ((Integer)session.call(objectName, "getMaxColumnNameLength",
true)).intValue();
        }

```

```

        public int getMaxColumnsInGroupBy() throws SQLException{
            return ((Integer)session.call(objectName, "getMaxColumnsInGroupBy",
true)).intValue();
        }

```

```

        public int getMaxColumnsInIndex() throws SQLException{
            return ((Integer)session.call(objectName, "getMaxColumnsInIndex",
true)).intValue();
        }

```

```

        public int getMaxColumnsInOrderBy() throws SQLException{

```

```

        return ((Integer)session.call(objectName, "getMaxColumnsInOrderBy",
true)).intValue();
    }

    public int getMaxColumnsInSelect() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxColumnsInSelect",
true)).intValue();
    }

    public int getMaxColumnsInTable() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxColumnsInTable",
true)).intValue();
    }

    public int getMaxConnections() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxConnections", true)).intValue();
    }

    public int getMaxCursorNameLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxCursorNameLength",
true)).intValue();
    }

    public int getMaxIndexLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxIndexLength",
true)).intValue();
    }

    public int getMaxSchemaNameLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxSchemaNameLength",
true)).intValue();
    }

    public int getMaxProcedureNameLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxProcedureNameLength",
true)).intValue();
    }

    public int getMaxCatalogNameLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxCatalogNameLength",
true)).intValue();
    }

    public int getMaxRowSize() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxRowSize", true)).intValue();
    }

```

```

    public boolean doesMaxRowSizeIncludeBlobs() throws SQLException{
        return ((Boolean)session.call(objectName, "doesMaxRowSizeIncludeBlobs",
true)).booleanValue();
    }

```

```

    public int getMaxStatementLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxStatementLength",
true)).intValue();
    }

```

```

    public int getMaxStatements() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxStatementLength",
true)).intValue();
    }

```

```

    public int getMaxTableNameLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxStatementLength",
true)).intValue();
    }

```

```

    public int getMaxTablesInSelect() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxStatementLength",
true)).intValue();
    }

```

```

    public int getMaxUserNameLength() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxStatementLength",
true)).intValue();
    }

```

```

    public int getDefaultTransactionIsolation() throws SQLException{
        return ((Integer)session.call(objectName, "getMaxStatementLength",
true)).intValue();
    }

```

```

    public boolean supportsTransactions() throws SQLException{
        return ((Boolean)session.call(objectName, "getMaxStatementLength",
true)).booleanValue();
    }

```

```

    public boolean supportsTransactionIsolationLevel(int level) throws
SQLException{
        return ((Boolean)session.call(objectName, "getMaxStatementLength",
true)).booleanValue();
    }

```

```

    public boolean supportsDataDefinitionAndDataManipulationTransactions()
    throws SQLException{
        return ((Boolean)session.call(objectName, "getMaxStatementLength",
true)).booleanValue();
    }

```

```

    public boolean supportsDataManipulationTransactionsOnly() throws
    SQLException{
        return ((Boolean)session.call(objectName, "getMaxStatementLength",
true)).booleanValue();
    }

```

```

    public boolean dataDefinitionCausesTransactionCommit() throws
    SQLException{
        return ((Boolean)session.call(objectName, "getMaxStatementLength",
true)).booleanValue();
    }

```

```

    public boolean dataDefinitionIgnoredInTransactions() throws SQLException{
        return ((Boolean)session.call(objectName, "getMaxStatementLength",
true)).booleanValue();
    }

```

```

    public ResultSet getProcedures(String catalog, String schemaPattern, String
procedureNamePattern) throws SQLException{
        return (ResultSet)session.call(objectName, "getProcedures", new Object[] {
catalog, schemaPattern, procedureNamePattern}, true);
    }

```

```

    public ResultSet getProcedureColumns(String catalog, String schemaPattern,
String procedureNamePattern, String columnNamePattern) throws SQLException{
        return (ResultSet)session.call(objectName, "getProcedureColumns", new Object[]
{ catalog, schemaPattern, procedureNamePattern, columnNamePattern}, true);
    }

```

```

    public ResultSet getTables(String catalog, String schemaPattern, String
tableNamePattern, String types[]) throws SQLException{
        return (ResultSet)session.call(objectName, "getTables", new Object[] {catalog,
schemaPattern, tableNamePattern, types}, true);
    }

```

```

    public ResultSet getSchemas() throws SQLException{
        return (ResultSet)session.call(objectName, "getSchemas", true);
    }

```

```

    public ResultSet getCatalogs() throws SQLException{
        return (ResultSet)session.call(objectName, "getCatalogs", true);
    }

```

```

    public ResultSet getTableTypes() throws SQLException{
        return (ResultSet)session.call(objectName, "getTableTypes", true);
    }

```

```

    public ResultSet getColumns(String catalog, String schemaPattern, String
tableNamePattern, String columnNamePattern) throws SQLException{
        return (ResultSet)session.call(objectName, "getColumns", new Object[]{catalog,
schemaPattern, tableNamePattern, columnNamePattern}, true);
    }

```

```

    public ResultSet getColumnPrivileges(String catalog, String schema,String table,
String columnNamePattern) throws SQLException{
        return (ResultSet)session.call(objectName, "getColumnPrivileges", new Object[]
{catalog, schema, table, columnNamePattern}, true);
    }

```

```

    public ResultSet getTablePrivileges(String catalog, String schemaPattern, String
tableNamePattern) throws SQLException{
        return (ResultSet)session.call(objectName, "getTablePrivileges", new Object[]
{catalog, schemaPattern, tableNamePattern}, true);
    }

```

```

    public ResultSet getBestRowIdentifier(String catalog, String schema, String table,
int scope, boolean nullable) throws SQLException{
        return (ResultSet)session.call(objectName, "getBestRowIdentifier", new Object[]
{catalog, schema, table, new Integer(scope), new Boolean(nullable)}, true);
    }

```

```

    public ResultSet getVersionColumns(String catalog, String schema, String table)
throws SQLException{
        return (ResultSet)session.call(objectName, "getVersionColumns", new Object[]
{catalog, schema, table}, true);
    }

```

```

    public ResultSet getPrimaryKeys(String catalog, String schema, String table)
throws SQLException{
        return (ResultSet)session.call(objectName, "getPrimaryKeys", new Object[]
{catalog, schema, table}, true);
    }

```

```

    public ResultSet getImportedKeys(String catalog, String schema, String table)
throws SQLException{

```



```

        return (ResultSet)session.call(objectName, "getImportedKeys", new Object[]
{catalog, schema, table}, true);
    }

```

```

    public ResultSet getExportedKeys(String catalog, String schema, String table)
throws SQLException{
        return (ResultSet)session.call(objectName, "getExportedKeys", new Object[]
{catalog, schema, table}, true);
    }

```

```

    public ResultSet getCrossReference( String primaryCatalog, String
primarySchema, String primaryTable, String foreignCatalog, String foreignSchema,
String foreignTable) throws SQLException{
        return (ResultSet)session.call(objectName, "getCrossReference", new Object[]
{primaryCatalog, primarySchema, primaryTable, foreignSchema, foreignTable}, true);
    }

```

```

    public ResultSet getTypeInfo() throws SQLException{
        return (ResultSet)session.call(objectName, "getTypeInfo", true);
    }

```

```

    public ResultSet getIndexInfo(String catalog, String schema, String table, boolean
unique, boolean approximate) throws SQLException{
        return (ResultSet)session.call(objectName, "getIndexInfo", new Object[] {catalog,
schema, table, new Boolean(unique), new Boolean(approximate)}, true);
    }

```

```

    public boolean supportsResultSetType(int type) throws SQLException{
        return ((Boolean)session.call(objectName, "supportsResultSetType", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

```

```

    public boolean supportsResultSetConcurrency(int type, int concurrency) throws
SQLException{
        return ((Boolean)session.call(objectName, "supportsResultSetConcurrency", new
Object[] {new Integer(type), new Integer(concurrency)}, true)).booleanValue();
    }

```

```

    public boolean ownUpdatesAreVisible(int type) throws SQLException{
        return ((Boolean)session.call(objectName, "ownUpdatesAreVisible", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

```

```

    public boolean ownDeletesAreVisible(int type) throws SQLException{
        return ((Boolean)session.call(objectName, "ownDeletesAreVisible", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

```

```

    }

    public boolean ownInsertsAreVisible(int type) throws SQLException{
        return ((Boolean)session.call(objectName, "ownInsertsAreVisible", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

    public boolean othersUpdatesAreVisible(int type) throws SQLException {
        return ((Boolean)session.call(objectName, "othersUpdatesAreVisible", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

    public boolean othersDeletesAreVisible(int type) throws SQLException {
        return ((Boolean)session.call(objectName, "othersDeletesAreVisible", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

    public boolean othersInsertsAreVisible(int type) throws SQLException {
        return ((Boolean)session.call(objectName, "othersInsertsAreVisible", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

    public boolean updatesAreDetected(int type) throws SQLException {
        return ((Boolean)session.call(objectName, "updatesAreDetected", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

    public boolean deletesAreDetected(int type) throws SQLException {
        return ((Boolean)session.call(objectName, "deletesAreDetected", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

    public boolean insertsAreDetected(int type) throws SQLException {
        return ((Boolean)session.call(objectName, "insertsAreDetected", new
Object[] {new Integer(type)}, true)).booleanValue();
    }

    public boolean supportsBatchUpdates() throws SQLException{
        return ((Boolean)session.call(objectName, "supportsBatchUpdates",
true)).booleanValue();
    }

    public ResultSet getUDTs(String catalog, String schemaPattern, String
typeNamePattern, int[] types) throws SQLException {
        return (ResultSet)session.call(objectName, "getUDTs", new Object[] { catalog,
schemaPattern, typeNamePattern, types}, true);
    }

```

```
}
```

```
public Connection getConnection() throws SQLException{  
    return connection;
```

```
}
```

```
}
```

Class HTTPJDBCDriver

```

package com.VSDV.HTTPJDBC.Client;

import java.sql.*;
import java.util.*;

import com.VSDV.HTTPJDBC.Common.*;
import com.VSDV.Global.*;

/**
 * Generic JDBC driver for tunneling all JDBC call over HTTP
 */
public class HTTPJDBCDriver implements Driver {

    private static HTTPJDBCDriver driver = new HTTPJDBCDriver();
    private HTTPJDBCSession session;

    public HTTPJDBCDriver() {
        try {
            Globals globals = Globals.getInstance();
            session = new HTTPJDBCSession(globals.getHost(), globals.getPort(), false);
            DriverManager.registerDriver(this);
        } catch (Exception ex) { ex.printStackTrace(); }
    }

    /**
     * Connects to servlet creates session
     * servlet in turn creates real JDBC connection
     * If there is a problem on the servlet side we wrap
     * it's exception in an SQLException
     */
    public Connection connect(String url,
                             Properties info)
        throws SQLException {
        StringTokenizer tokenizer = new StringTokenizer(url, ":");
        String protocol = tokenizer.nextToken();
        String host = tokenizer.nextToken();
        int port = Integer.parseInt(tokenizer.nextToken());
        boolean secure = false;
        if (protocol.equals("httpjdbc"))
            secure = false;
        else if (protocol.equals("httpsjdbc")) {
            secure = true;
        }
    }

```

```

String objectName = (String)session.call("driver", "connect", new Object[] {url, info},
true );
    HTTPJDBCCConnection con = new HTTPJDBCCConnection(session, objectName);
    return con;
}

public boolean acceptsURL(String url) throws SQLException {
    StringTokenizer tokenizer = new StringTokenizer(url, ":");
    String a = tokenizer.nextToken();
    if (a.equals("httpjdbc") )
        return true;
    else if (a.equals("httpsjdbc") )
        return true;
    else
        return false;
}

public DriverPropertyInfo[] getPropertyInfo(String url,
                                           Properties info) throws SQLException {
    return null;
}

public int getMajorVersion() { return 1; }

public int getMinorVersion() { return 1; }

public boolean jdbcCompliant() { return true; }
}

```

Class HTTPJDBCPreparedStatement

```
package com.VSDV.HTTPJDBC.Client;
```

```
import java.sql.*;
import java.math.*;
import java.io.*;
import java.util.*;
```

```
import com.VSDV.HTTPJDBC.Common.*;
```

```
public class HTTPJDBCPreparedStatement extends HTTPJDBCStatement implements
PreparedStatement {
```

```
    public HTTPJDBCPreparedStatement(HTTPJDBCConnection con, Object[]
parameters) {
        super(con, parameters);
    }
```

```
    public void initializeStatement(HTTPJDBCConnection con, Object[] parameters){
        InObject defaultMethodObject = new InObject(con.getName(), "", parameters, true);
        defaultMethodObject.setMethod("prepareStatement");
        addToMethodList(defaultMethodObject);
    }
```

```
    public ResultSet executeQuery() throws SQLException {
        checkForClosed();
        InObject inObject = new InObject(objectName, "executeQuery", true);
        addToMethodList(inObject);
        ResultSet rset = (ResultSet)makeCall();
        return rset;
    }
```

```
    public int executeUpdate() throws SQLException {
        checkForClosed();
        InObject inObject = new InObject(objectName, "executeUpdate", true);
        addToMethodList(inObject);
        Integer i = (Integer)makeCall();
        return i.intValue();
    }
```

```
    public boolean execute() throws SQLException {
        checkForClosed();
        InObject inObject = new InObject(objectName, "execute", true);
        addToMethodList(inObject);
    }
```

```

    Boolean b = (Boolean)makeCall();
    return b.booleanValue();
}

```

```

public void setNull(int parameterIndex, int sqlType) throws SQLException {
    InObject inObject = new InObject(objectName, "setNull", new Object[] {new
Integer(parameterIndex), new Integer(sqlType)}, false);
    addToMethodList(inObject);
}

```

```

public void setBoolean(int parameterIndex, boolean x) throws SQLException {
    InObject inObject = new InObject(objectName, "setBoolean", new Object[] {new
Integer(parameterIndex), new Boolean(x)}, false );
    addToMethodList(inObject);
}

```

```

public void setByte(int parameterIndex, byte x) throws SQLException {
    InObject inObject = new InObject(objectName, "setByte", new Object[] {new
Integer(parameterIndex), new Byte(x)}, false );
    addToMethodList(inObject);
}

```

```

public void setShort(int parameterIndex, short x) throws SQLException {
    InObject inObject = new InObject(objectName, "setShort", new Object[] {new
Integer(parameterIndex), new Short(x)}, false );
    addToMethodList(inObject);
}

```

```

public void setInt(int parameterIndex, int x) throws SQLException {
    InObject inObject = new InObject(objectName, "setInt", new Object[] {new
Integer(parameterIndex), new Integer(x)}, false );
    addToMethodList(inObject);
}

```

```

public void setLong(int parameterIndex, long x) throws SQLException {
    InObject inObject = new InObject(objectName, "setLong", new Object[] {new
Integer(parameterIndex), new Long(x)}, false );
    addToMethodList(inObject);
}

```

```

public void setFloat(int parameterIndex, float x) throws SQLException {
    InObject inObject = new InObject(objectName, "setFloat", new Object[] {new
Integer(parameterIndex), new Float(x)}, false );
    addToMethodList(inObject);
}

```

```

public void setDouble(int parameterIndex, double x) throws SQLException {
    InObject inObject = new InObject(objectName, "setDouble", new Object[] {new
Integer(parameterIndex), new Double(x)}, false );
    addToMethodList(inObject);
}

public void setBigDecimal(int parameterIndex, BigDecimal x) throws SQLException {
    InObject inObject = new InObject(objectName, "setBigDecimal", new Object[] {new
Integer(parameterIndex), x}, false );
    addToMethodList(inObject);
}

public void setString(int parameterIndex, String x) throws SQLException {
    // To be compatible with earlier drivers. By specs we should use setNull()
    if (x == null){
        setNull(parameterIndex, Types.VARCHAR);
        return;
    }
    InObject inObject = new InObject(objectName, "setString", new Object[] {new
Integer(parameterIndex), x}, false );
    addToMethodList(inObject);
}

public void setBytes(int parameterIndex, byte x[]) throws SQLException {
    InObject inObject = new InObject(objectName, "setBytes", new Object[] {new
Integer(parameterIndex), x}, false );
    addToMethodList(inObject);
}

public void setDate(int parameterIndex, java.sql.Date x) throws SQLException {
    InObject inObject = new InObject(objectName, "setDate", new Object[] {new
Integer(parameterIndex), x}, false );
    addToMethodList(inObject);
}

public void setTime(int parameterIndex, java.sql.Time x) throws SQLException {
    InObject inObject = new InObject(objectName, "setTime", new Object[] {new
Integer(parameterIndex), x}, false );
    addToMethodList(inObject);
}

public void setTimestamp(int parameterIndex, java.sql.Timestamp x) throws
SQLException {
    InObject inObject = new InObject(objectName, "setTimestamp", new Object[] {new
Integer(parameterIndex), x}, false );
    addToMethodList(inObject);
}

```



```

    }

    public void setAsciiStream(int parameterIndex, InputStream input, int length) throws
    SQLException {
        int i = 0;
        byte bytes[];
        try {
            bytes = new byte[input.available()];
            input.read(bytes);
            input.close();
        } catch (IOException ioe) {
            throw new SQLException("Unable to set the Ascii stream to the statement");
        }
        InObject inObject = new InObject(objectName, "setAsciiStream", new Object[] {
        new Integer(parameterIndex), bytes, new Integer(length)}, false);
        addToMethodList(inObject);
    }

    public void setUnicodeStream(int parameterIndex, InputStream input, int
    length) throws SQLException {
        int i = 0;
        byte bytes[];
        try {
            bytes = new byte[input.available()];
            input.read(bytes);
            input.close();
        } catch (IOException ioe) {
            throw new SQLException("Unable to set the Unicode stream to the statement");
        }
        InObject inObject = new InObject(objectName, "setUnicodeStream", new Object[]
        {new Integer(parameterIndex), bytes, new Integer(length)}, false);
        addToMethodList(inObject);
    }

    public void setBinaryStream(int parameterIndex, java.io.InputStream input, int length)
    throws SQLException {
        int i=0;
        int singleByte;
        byte[] bytes;
        try {
            bytes = new byte[input.available()];
            input.read(bytes);
            input.close();
        } catch (IOException ioe) {
            throw new SQLException("Cannot set the binary stream to the statement");

```

```

    }
    InObject inObject = new InObject(objectName, "setBinaryStream", new Object[] {new
Integer(parameterIndex), bytes, new Integer(length)}, false);
    addToMethodList(inObject);
}

public void clearParameters() throws SQLException {
    session.call(objectName, "clearParameters", false);
}

public void setObject(int parameterIndex, Object x, int targetSqlType, int scale)throws
SQLException {
    Object[] params = new Object[] {new Integer(parameterIndex), x, new
Integer(targetSqlType), new Integer(scale) };
    Class[] paramTypes = new Class[] {Integer.class, Object.class, Integer.class,
Integer.class};
    InObject inObject = new InObject(objectName, "setObject", params, paramTypes,
false);
    addToMethodList(inObject);
}

public void setObject(int parameterIndex, Object x, int targetSqlType) throws
SQLException {
    Object[] params = new Object[] {new Integer(parameterIndex), x, new
Integer(targetSqlType)};
    Class[] paramTypes = new Class[] {Integer.class, Object.class, Integer.class};
    InObject inObject = new InObject(objectName, "setObject", params, paramTypes,
false);
    addToMethodList(inObject);
}

public void setObject(int parameterIndex, Object x) throws SQLException {
    Object[] params = new Object[] {new Integer(parameterIndex), x};
    Class[] paramTypes = new Class[] {Integer.class, Object.class};
    InObject inObject = new InObject(objectName, "setObject", params, paramTypes,
false );
    addToMethodList(inObject);
}

// ***** JDBC 2.0 *****

public void addBatch() throws SQLException {
    addToMethodList(new InObject(objectName, "addBatch", true));
}

```

```
public void setCharacterStream(int parameterIndex,  
                               java.io.Reader reader,  
                               int length ) throws SQLException {  
  
}
```

```
public void setRef (int i, Ref x) throws SQLException {  
  
}
```

```
public void setBlob (int i, Blob x) throws SQLException {  
  
}
```

```
public void setClob (int i, Clob x ) throws SQLException {  
  
}
```

```
public void setArray (int i, Array x ) throws SQLException {  
  
}
```

```
public ResultSetMetaData getMetaData() throws SQLException {  
    return null;  
}
```

```
public void setDate(int parameterIndex, java.sql.Date x, Calendar cal) throws  
SQLException {  
  
}
```

```
public void setTime(int parameterIndex, java.sql.Time x, Calendar cal)  
    throws SQLException {  
  
}
```

```
public void setTimestamp(int parameterIndex, java.sql.Timestamp x, Calendar cal)  
    throws SQLException {
```

```
}
```

```
public void setNull (int paramIndex, int sqlType, String typeName) throws  
SQLException {
```

```
}
```

```
}
```

Class HTTPJDBCSession

```

package com.VSDV.HTTPJDBC.Client;

import java.io.*;
import java.sql.*;
import java.net.*;

import javax.swing.Timer;
import java.awt.event.*;
import java.applet.*;
import java.util.*;
import com.VSDV.HTTPJDBC.Common.*;

public class HTTPJDBCSession {

    URL url, streamURL;
    Timer timer;
    private String sessionID;
    boolean secure;

    public HTTPJDBCSession(String host, int port, boolean secure) {
        try {
            this.secure = secure;
            String secureStr = "http";
            if (secure)
                secureStr = "https";
            else
                secureStr = "http";
            url = new URL(secureStr, host, port, "/JDBCServlet");
            createSession();
        } catch (Exception ex) {
            ex.printStackTrace();
        }
    }

    public String getID(){
        return sessionID;
    }

    public void createSession() throws Exception {
        Hashtable hash = new Hashtable();
        hash.put("action", "createSession");
        InputStream input = doGet(url, hash);
        ObjectInputStream objInput = new ObjectInputStream(input);
    }

```

```

    sessionID = (String)objInput.readObject();
    objInput.close();
}

```

```

public InputStream doGet(URL u, Hashtable hash) throws Exception {
    String parameters = doGetParameters(hash);
    URL url = new URL(u.toString()+"?" + parameters);
    URLConnection urlConnection = url.openConnection();
    urlConnection.setDoInput(true);
    return urlConnection.getInputStream();
}

```

```

private String doGetParameters(Hashtable hash) {
    String returnStr = "";
    Enumeration enum = hash.keys();
    while (enum.hasMoreElements() ) {
        String key = (String)enum.nextElement();
        String value = (String)hash.get(key);
        returnStr += key+"="+value+"&";
    }
    return returnStr;
}

```

```

public InputStream doPost(URL url, byte[] data) throws IOException {
    URLConnection urlConnection = url.openConnection();
    urlConnection.setUseCaches(false);
    urlConnection.setRequestProperty("content-length", String.valueOf(data.length) );
    urlConnection.setDoOutput(true);
    OutputStream out = new BufferedOutputStream(urlConnection.getOutputStream() );
    for (int x=0; x < data.length; x++) {
        out.write(data[x]);
    }
    out.close();
    return new BufferedInputStream(urlConnection.getInputStream() );
}

```

```

public Object call(String objName, String method, boolean hasReturnValue) throws
SQLException {
    return call(objName, method, null,hasReturnValue);
}

```

```

public Object call(String objName, String method, Object[] params, Class[]
paramTypes, boolean hasReturnValue) throws SQLException {
    InObject inObj = new InObject(sessionID, objName, method, params,
paramTypes,hasReturnValue);
}

```

```

    return makeCall(inObj);
}

```

```

public Object call(String objName, String method, Object[] params, boolean
hasReturnValue) throws SQLException {
    InObject inObj = new InObject(sessionID, objName, method, params,
hasReturnValue);
    return makeCall(inObj);
}

```

```

private Object makeCall(InObject inObject) throws SQLException {
    try {
        ByteArrayOutputStream byteOut = new ByteArrayOutputStream();
        ObjectOutputStream objOut = new ObjectOutputStream(byteOut);
        objOut.writeObject(inObject);
        byte[] paramData = byteOut.toByteArray();

        InputStream in=null;
        if (inObject.hasReturnValue() ){
            in = doPost(url, paramData);
            ObjectInputStream objIn = new ObjectInputStream(in);
            Object readObject = (Object)objIn.readObject();
            objIn.close();
            if (readObject instanceof NullObject) return null;
            if (readObject instanceof SQLException) {
                throw (SQLException)readObject;
            } else if (readObject instanceof Exception) {
                throw new SQLException( ((Exception)readObject).getMessage() );
            } else {
                return readObject;
            }
        } else {
            doPost(url, paramData);
            return null;
        }
    } catch (Exception ex) {
        ex.printStackTrace();
        throw new SQLException( ex.getMessage() );
    }
}

```

```

public Class[] getParameterTypes(Object[] params) {
    if (params == null) return null;
    Class[] paramTypes = new Class[params.length];
    for (int x=0; x < paramTypes.length; x++) {
        Class c = params[x].getClass();
        paramTypes[x] = adjustIt(c);
    }
}

```

```

    }
    return paramTypes;
}

private Class adjustIt(Class c) {
    if (Integer.class.equals(c) ) return Integer.TYPE;
    else if (Boolean.class.equals(c) ) return Boolean.TYPE;
    else if (Character.class.equals(c) ) return Character.TYPE;
    else if (Byte.class.equals(c) ) return Byte.TYPE;
    else if (Short.class.equals(c) ) return Short.TYPE;
    else if (Long.class.equals(c) ) return Long.TYPE;
    else if (Float.class.equals(c) ) return Float.TYPE;
    else if (Double.class.equals(c) ) return Double.TYPE;
    else return c;
}

public Object call(ArrayList methodList) throws SQLException{
    OutObject outObject = null;
    try {
        ByteArrayOutputStream byteOut = new ByteArrayOutputStream();
        ObjectOutputStream objOut = new ObjectOutputStream(byteOut);
        objOut.writeObject(methodList);
        byte[] paramData = byteOut.toByteArray();

        InputStream in=null;
        in = doPost(url, paramData);
        ObjectInputStream objIn = new ObjectInputStream(in);
        Object returnObject = objIn.readObject();
        objIn.close();
        if (returnObject instanceof NullObject){
            return null;
        }
        if (returnObject instanceof OutObject){
            outObject = (OutObject)returnObject;
        }
        if (returnObject instanceof SQLException) {
            throw (SQLException)returnObject;
        } else if (returnObject instanceof Exception) {
            throw new SQLException(((Exception)returnObject).getMessage());
        } else {
            return outObject;
        }
    } catch (Exception ex) {
        ex.printStackTrace();
        throw new SQLException( ex.getMessage() );
    }
}

```


}

09/23/2020 09:04:04

Class HTTPJDBCStatement

```

package com.VSDV.HTTPJDBC.Client;

import java.sql.*;
import java.util.*;

import com.VSDV.HTTPJDBC.Common.*;

/**
 * Implements remoted functionality for java.sql.Statement
 */
public class HTTPJDBCStatement extends JDBCStub implements Statement {

    protected HTTPJDBCConnection con;
    protected HTTPJDBCSession session;
    protected MethodList methodList = new MethodList();
    protected boolean closed = false;
    public HTTPJDBCStatement(HTTPJDBCConnection con) {
        this.con = con;
        session = con.getHTTPJDBCSession();
        initializeStatement(con, null);
    }

    public HTTPJDBCStatement(HTTPJDBCConnection con, Object[] parameters){
        this.con = con;
        session = con.getHTTPJDBCSession();
        initializeStatement(con, parameters);
    }

    public void initializeStatement(HTTPJDBCConnection con, Object[] parameters){
        InObject defaultMethodObject = new InObject(con.getName(), "", false);
        defaultMethodObject.setMethod("createStatement");
        addToMethodList(defaultMethodObject);
    }

    public ResultSet executeQuery(String sql) throws SQLException {
        checkForClosed();
        addToMethodList(new InObject(session.getID(), objectName, "executeQuery", new
Object[] {sql}, true));
        ResultSet rset = (ResultSet)makeCall();
        return rset;
    }

    public ResultSet executeQueryAndClose(String sql) throws SQLException{

```

```

        checkForClosed();
        addToMethodList(new InObject(session.getID(), objectName, "executeQuery", new
Object[] {sql}, true));
        InObject inObject = new InObject(objectName, "close", false);
        addToMethodList(inObject);
        ResultSet rset = (ResultSet)makeCall();
        methodList.removeAll(methodList);
        closed = true;
        return rset;
    }

    public void close() throws SQLException {
        session.call(objectName, "close", false);
        closed = true;
    }

    public boolean executeAndClose(String sql) throws SQLException {
        checkForClosed();
        InObject inObject = new InObject(objectName, "execute", new Object[] {sql}, true );
        addToMethodList(inObject);
        Boolean b = (Boolean)makeCall();
        return b.booleanValue();
    }

    public boolean execute(String sql) throws SQLException {
        checkForClosed();
        InObject inObject = new InObject(objectName, "execute", new Object[] {sql}, true );
        addToMethodList(inObject);
        Boolean b = (Boolean)makeCall();
        return b.booleanValue();
    }

    protected void checkForClosed() throws SQLException{
        if (closed){
            throw new SQLException("Error : called method on a closed Statement");
        }
    }

    protected Object makeCall() throws SQLException{
        OutObject resultObject = (OutObject)session.call(methodList);
        tagWithReferenceNameAndRefresh(resultObject.getName());
        return resultObject.getResultObject();
    }

    private void tagWithReferenceNameAndRefresh(String name){
        setName(name);
    }

```

```

methodList.setName(name);
methodList.removeAll(methodList);
}

public int executeUpdate(String sql) throws SQLException {
    checkForClosed();
    addToMethodList(new InObject(session.getID(), objectName, "executeUpdate", new
Object[] {sql}, true));
    Integer i = (Integer)makeCall();
    return i.intValue();
}

public void setEscapeProcessing(boolean enable) throws SQLException {
    session.call(objectName, "setEscapeProcessing", new Object[] {new
Boolean(enable)}, false );
}

public int getMaxFieldSize() throws SQLException {
    Integer i = (Integer)session.call(objectName, "getMaxFieldSize", true);
    return i.intValue();
}

public void setMaxFieldSize(int max) throws SQLException {
    session.call(objectName, "setMaxFieldSize", new Object[] {new Integer(max)}, false);
}

public int getMaxRows() throws SQLException {
    Integer i = (Integer)session.call(objectName, "getMaxRows", true );
    return i.intValue();
}

public void setMaxRows(int max) throws SQLException {
    addToMethodList(new InObject(session.getID(), objectName, "setMaxRows", new
Object[] {new Integer(max)}, true));
}

public int getQueryTimeout()throws SQLException {
    Integer i = (Integer)session.call(objectName, "getQueryTimeout",true);
    return i.intValue();
}

public void setQueryTimeout(int seconds) throws SQLException {
    session.call(objectName, "setQueryTimeout", new Object[] {new
Integer(seconds)}, false );
}

```

```

public void cancel() throws SQLException {
    session.call(objectName, "cancel", false );
}

public SQLWarning getWarnings() throws SQLException {
    return null;
}

public void clearWarnings() throws SQLException {

}

public void setCursorName(String name) throws SQLException {
    session.call(objectName, "setCursorName", new Object[] {name}, false );
}

public ResultSet getResultSet() throws SQLException {
    return null;
}

public int getUpdateCount() throws SQLException {
    Integer i = (Integer)session.call(objectName, "getUpdateCount", true);
    return i.intValue();
}

public boolean getMoreResults() throws SQLException {
    Boolean i = (Boolean)session.call(objectName, "getMoreResults", true );
    return i.booleanValue();
}

public void setFetchDirection(int direction) throws SQLException {

}

public int getFetchDirection() throws SQLException {
    return 1;
}

public void setFetchSize(int rows) throws SQLException {
    addToMethodList(new InObject(session.getID(), objectName, "setFetchSize", new
Object[] {new Integer(rows)}, true));
}

public int getFetchSize() throws SQLException {
    return 1;
}

```

```

public int getResultSetConcurrency() throws SQLException {
    return 1;
}

public int getResultSetType() throws SQLException {
    return 1;
}

public void addBatch(String sql) throws SQLException {
    addToMethodList(new InObject(objectName, "addBatch", new Object[] {sql}, true));
}

public void clearBatch() throws SQLException {

}

public int[] executeBatch() throws SQLException {
    addToMethodList(new InObject(objectName, "executeBatch", true));
    Object obj = makeCall();
    return new int[] {1, 2};
}

public Connection getConnection() throws SQLException {
    return con;
}

HTTPJDBCConnection getHTTPJDBCConnection() {
    return con;
}

protected void addToMethodList(InObject object){
    object.setSessionID(session.getID());
    methodList.add(object);
}

public void finalize(){
    if (!closed){
        try{
            close();
        } catch(SQLException sqle){
            sqle.printStackTrace();
        }
    }
}
}

```

Class JDBCStub

```
package com.VSDV.HTTPJDBC.Client;

import java.sql.*;

/**
 * Simple root class to be used for stuff like HTTPJDBCStatement etc.
 * Basically forces the child objects to use an object name
 */

public abstract class JDBCStub {

    public String objectName=null;

    public JDBCStub(String objectName) {
        this.objectName = objectName;
    }

    public JDBCStub(){
    }

    public void setName(String name) {
        objectName = name;
    }

    public String getName(){
        return objectName;
    }
}
```

Common Classes Used by both the Server and Client

<u>Class InObject</u>	2
<u>Class MethodList</u>	6
<u>Class NullObject</u>	7
<u>Class OutObject</u>	8

Class InObject

```
package com.VSDV.HTTPJDBC.Common;
```

```
import java.io.*;
```

```
/**
```

```
 * Object that is serialized containing information about which
 * object to call which method on with the method's parameters
 * It also contains the sessionId used by the server to allow
 * for sessions over HTTP
 * Cookies were originally used then abandoned because
 * the Java plugin did not seem to retrieve cookie data
 * from the servlet hence not passing it back upon subsequent
 * calls to the servlet
 */
```

```
/*
```

```
  To Do :
```

1. Make this object much lighter.
2. Let the servlet do the createInputStreamFromBytes

```
*/
```

```
public class InObject implements Serializable{
```

```
    static final long serialVersionUID = 4064151811232982612L;
```

```
    public String method, objectName;
```

```
    public Object[] parameters;
```

```
    public Class[] parameterTypes = null;
```

```
    boolean returnsStream = false;
```

```
    String sessionId;
```

```
    boolean hasReturnValue;    // to avoid null return
```

```
    public InObject(String sessionId, String objectName, String method, Object[]
parameters, boolean hasReturnValue) { // to avoid null return
```

```
        this.sessionId = sessionId;
```

```
        this.objectName = objectName;
```

```
        this.hasReturnValue = hasReturnValue;
```

```
        this.method = method;
```

```
        this.parameters = parameters;
```

```
        if (parameters != null)
```

```
            this.parameterTypes = getTypes(parameters);
```

```
        else
```

```

    this.parameterTypes = null;
}

```

```

public InObject(String sessionId, String objectName, String method,
    Object[] parameters, Class[] parameterTypes,
    boolean hasReturnValue ) {
    this(sessionId, objectName, method, parameters, hasReturnValue);
    this.parameterTypes = parameterTypes;
}

```

```

public InObject(String objectName, String method, boolean hasReturnValue){
    this(null, objectName, method, null, hasReturnValue);
}

```

```

public InObject(String objectName, String method, Object[] parameters, boolean
hasReturnValue){
    this(null, objectName, method, parameters, hasReturnValue);
}

```

```

public InObject(String objectName, String method, Object[] parameters, Class[]
parameterTypes, boolean hasReturnValue ) {
    this(null, objectName, method, parameters, parameterTypes, hasReturnValue);
}

```

```

public String getSessionId() { return sessionId; }

```

```

public String getMethodName() { return method; }

```

```

public String getObjectNames() { return objectNames; }

```

```

public Object[] getParameters() {
    return parameters;
}

```

```

/* public void createInputStreamFromBytes(){
    if (!getMethodName().equals("setBinaryStream")){
        return;
    }
    if ( !(parameters[1] instanceof ByteArrayInputStream)){
        parameters[1] = getInputStreamFromBytes((byte[])parameters[1]);
        parameterTypes[1] = java.io.InputStream.class;
    }
}*/

```

```

public void createInputStreamFromBytes(){

```

```

        if(getMethodName().equals("setBinaryStream") ||
getMethodName().equals("setAsciiStream") ||
getMethodName().equals("setUnicodeStream")){
            System.out.println("getMethodName : " + getMethodName());
            if(!(parameters[1] instanceof ByteArrayInputStream)){
                parameters[1] = getInputStreamFromBytes((byte[])parameters[1]);
                parameterTypes[1] = java.io.InputStream.class;
            }
        }
    }
}

```

```

public Class[] getParameterTypes() {
    return adjustThem(parameterTypes);
}

```

```

public boolean hasReturnValue () {
    return hasReturnValue ;
}

```

```

private Class[] getTypes(Object[] params) {
    if (params == null) return null;
    Class[] classes = new Class[params.length];
    for (int x=0; x < params.length; x++) {
        classes[x] = params[x].getClass();
    }
    return classes;
}

```

```

private Class[] adjustThem(Class[] classes) {
    if (classes == null) return null;
    for (int x=0; x < classes.length; x++) {
        classes[x] = adjustIt(classes[x]);
    }
    return classes;
}

```

```

private Class adjustIt(Class c) {
    if (Integer.class.equals(c) ) return Integer.TYPE;
    else if (Boolean.class.equals(c) ) return Boolean.TYPE;
    else if (Character.class.equals(c) ) return Character.TYPE;
    else if (Byte.class.equals(c) ) return Byte.TYPE;
    else if (Short.class.equals(c) ) return Short.TYPE;
    else if (Long.class.equals(c) ) return Long.TYPE;
    else if (Float.class.equals(c) ) return Float.TYPE;
    else if (Double.class.equals(c) ) return Double.TYPE;
}

```

```
    else return c;
}

public boolean getReturnsStream() { return returnsStream; }

public String toString(){
    return "Session : "+getSessionId()+" Object Name : "+getObjectName()+"
"+getMethodName();
}

public void setSessionID(String sessionID){
    this.sessionId = sessionID;
}

public void setMethod(String method){
    this.method = method;
}

private InputStream getInputStreamFromBytes(byte[] bytes){
    return new ByteArrayInputStream(bytes);
}
}
```

Class MethodList

```
package com.VSDV.HTTPJDBC.Common;
```

```
import java.util.*;
```

```
public class MethodList extends ArrayList{  
    private String listName;  
    public MethodList(){  
    }  

```

```
    public void setName(String name){  
        listName = name;  
    }  

```

```
    public String getName(){  
        return listName;  
    }  
}
```

Class NullObject

```
package com.VSDV.HTTPJDBC.Common;
```

```
import java.io.*;
```

```
/**
```

```
 * Null object used for remote method calls because passing null around doesn't work
```

```
 * it needs it's own object
```

```
 * The serialVersionUID is to insure this class can be recompiled
```

```
 * and still be passed around without the remote end choking
```

```
 * because the serialVersionUID are different.
```

```
 */
```

```
public class NullObject implements Serializable {
```

```
    static final long serialVersionUID = 1333822856806054836L;
```

```
}
```

Class OutObject

```
package com.VSDV.HTTPJDBC.Common;
import java.io.*;
```

```
public class OutObject implements Serializable{
    private String name;
    private Object result;
    public OutObject(String name, Object result) {
        this.name = name;
        this.result = result;
    }
}
```

```
public String getName(){
    return name;
}
```

```
// Result Object can be instanceof ResultSet, SQLException, Exception etc.
```

```
public Object getResultObject(){
    return result;
}
}
```

Server Side Classes

<u>Class DBConnectionFactory</u>	2
<u>Class DBVendor</u>	3
<u>Class JDBCServerConnection</u>	4
<u>Class JDBCServerSession</u>	6
<u>Class JDBCServlet</u>	9
<u>Class Oracle.java</u>	15
<u>Class ServerSessions</u>	16
<u>Class SQLServer</u>	19

Class DBConnectionFactory

```
package com.VSDV.HTTPJDBC.Server;

import java.sql.*;
import java.util.*;

public class DBConnectionFactory {
    private DBConnectionFactory() {
    }

    public static Connection createConnection(Properties properties) throws
    SQLException{
        String vendor = (String)properties.get("DBVENDOR");
        DBVendor dbVendor = null;
        if (vendor.equals("ORACLE")){
            dbVendor = new Oracle(properties);
        } else if (vendor.equals("SQLSERVER")){
            dbVendor = new SQLServer(properties);
        }
        if (dbVendor == null){
            throw new SQLException("Fatal error - No database vendor specified");
        }
        return dbVendor.createConnectionFromProperties();
    }
}
```

Class DBVendor

```
package com.VSDV.HTTPJDBC.Server;
```

```
import java.sql.*;
```

```
public interface DBVendor {  
    public Connection createConnectionFromProperties() throws SQLException;  
}
```

Class JDBCServerConnection

```
package com.VSDV.HTTPJDBC.Server;

import com.VSDV.VerticalSuite.*;
import javax.servlet.http.*;
import javax.servlet.*;
import java.sql.*;
import java.io.*;

public class JDBCServerConnection implements HttpSessionBindingListener{
    private Connection connection;
    private String connectionName;
    private ServletContext context;
    public JDBCServerConnection(String name, Connection connection, ServletContext context) {
        this.connection = connection;
        connectionName = name;
        this.context = context;
    }

    public void valueBound(HttpSessionBindingEvent e){
        HttpSession session = e.getSession();
        FileOutputStream file = (FileOutputStream)session.getAttribute(GenericLoginServlet.VSLOGFILE);
        try{
            if (file != null){
                String s = "Connection Made : "+connectionName;
                file.write(s.getBytes());
            }
        }catch(IOException ioe){
            ioe.printStackTrace();
        }
    }

    // The following method does the following
    // when the session is invalidated/timed out
    // 1. db connection is closed.
    // 2. removes this object from the session application layers data.
    public void valueUnbound(HttpSessionBindingEvent e){
        HttpSession session = e.getSession();
        context.log("Unbound : "+connectionName);
        try{
            connection.close();
        } catch(SQLException sqle){
            try {
                FileOutputStream file = (FileOutputStream)session.getAttribute(GenericLoginServlet.VSLOGFILE);
                if (file != null){
                    String s = "***** Connection : "+connectionName+" Closed. *****";
                    file.write(s.getBytes());
                    sqle.printStackTrace(new PrintStream(file));
                }
            }catch(IOException ioe){
                ioe.printStackTrace();
                context.log(ioe.getMessage());
            }
        }
    }
}
```

```
}  
// remove this from the current session  
ServerSessions sessions = JDBCServlet.getServerSessions();  
sessions.disposeSession(connectionName);  
session.removeAttribute(connectionName);  
}  
}
```

Class JDBCServerSession

```
package com.VSDV.HTTPJDBC.Server;

import java.io.*;
import java.util.*;
import javax.servlet.http.*;
import javax.servlet.*;
import java.sql.*;
import java.lang.reflect.*;

/**
 * Session used by servlet corresponding to LFRT Applet
 * client user logging session
 * Holds JDBC objects on behalf of the user
 */
public class JDBCServerSession implements Serializable {

    ServletContext context;
    Driver driver;
    Hashtable hash;
    int objNameCounter=1;
    long lastRenewed;
    String sessionId;
    Vector objectNameIndex = new Vector();

    public JDBCServerSession(ServletContext context) {
        this.context = context;
        hash = new Hashtable();
    }

    public void setSessionId(String id) {
        sessionId = id;
    }

    public String getSessionId() {
        return sessionId;
    }

    public long getLastRenewed() {
        return lastRenewed;
    }
}
```

```

/**
 * Returns objects from session based on a name
 */
public Object getObject(String objectName) {
    return hash.get(objectName);
}

public Object[] getObjects() {
    Object[] objects = new Object[hash.size()];
    Enumeration enum = hash.elements();
    int count = 0;
    while (enum.hasMoreElements() ) {
        objects[count] = (Object)enum.nextElement();
        count++;
    }
    return objects;
}

/**
 * Sets objects into the session based on a name
 */
public String setObject(Object obj) {
    String objectName = objNameCounter+"";
    hash.put(objectName, obj);
    // context.log(objectName+" setObject = "+ obj);
    objNameCounter++;
    objectNameIndex.addElement(objectName);
    return objectName;
}

/**
 * Renews keepalive or lease for this session so it
 * doesn't get killed
 */
public void renew() {
    lastRenewed = System.currentTimeMillis();
}

/**
 * Closes up all objects associated with this session
 */
public void close() {
    try {
        Enumeration enum = hash.elements();
        while (enum.hasMoreElements() ) {
            Object obj = enum.nextElement();

```

```

        closeObject(obj);
    }
    } catch (Exception ex) { ex.printStackTrace(); }
}

/**
 * Closes out JDBC objects when this session is tossed in the trash
 */
public void closeObject(Object obj, String objectName) {
    try {
        Class c = obj.getClass();
        Method method = c.getMethod("close", null);
        method.invoke(obj, null);
        hash.remove(objectName);
    } catch (Exception ex) {
        context.log("Error closing object "+obj.toString());
    }
}

public void closeObject(Object obj) {
    try {
        Class c = obj.getClass();
        Method method = c.getMethod("close", null);
        method.invoke(obj, null);
        hash.remove(obj);
    } catch (Exception ex) {
        context.log("Error closing object "+obj.toString());
    }
}
}

```

Class JDBCServlet

```
package com.VSDV.HTTPJDBC.Server;

import javax.servlet.*;
import javax.servlet.http.*;
import java.io.*;
import java.util.*;
import java.lang.reflect.*;
import java.sql.*;
import com.VSDV.RowSet.*;

import com.VSDV.HTTPJDBC.Common.*;

public class JDBCServlet extends HttpServlet{

    public static ServerSessions sessions;
    Driver poolDriver;
    Properties poolProps;
    ServletContext context;
    ServletConfig config;

    public void init(ServletConfig config) throws ServletException {
        super.init(config);
        context = config.getServletContext();
        sessions = new ServerSessions(context);
        try {
            this.config = config;
            poolDriver = (Driver) Class.forName("weblogic.jdbc20.oci.Driver").newInstance();
        } catch (Exception ex) { context.log("", ex); }
    }

    public static ServerSessions getServerSessions() {
        return sessions;
    }

    public void doGet(HttpServletRequest req, HttpServletResponse res) throws
    ServletException, IOException {
        // HttpSession session = req.getSession();
        String action = req.getParameterValues("action")[0];
        if (action.equals("renew") ) {
            String sessionId = req.getParameterValues("sessionId")[0];
            JDBCServerSession s = sessions.getSession(sessionId);
            s.renew();
        } else if (action.equals("createSession") ) {
```



```

String sessionId = sessions.addSession(new JDBCServerSession(context));
OutputStream out = res.getOutputStream();
ObjectOutputStream objOut = new ObjectOutputStream(out);
objOut.writeObject(sessionId);
objOut.flush();
objOut.close();
// session.setAttribute(sessionId, new Session(sessionId, context));
}
}

private void sendResultObject(HttpServletResponse res, Object resultObject) throws
IOException{
    OutputStream out = res.getOutputStream();
    ObjectOutputStream objOut = new ObjectOutputStream(out);
    objOut.writeObject(resultObject);
    objOut.flush();
    objOut.close();
}

public void doPost(HttpServletRequest req, HttpServletResponse res) throws
ServletException, IOException {
    // HttpSession session = req.getSession();
    Object returnValue=null, obj=null;
    context = config.getServletContext();
    Object inObject = null;
    try {
        InputStream in = req.getInputStream();
        ObjectInputStream objIn = new ObjectInputStream(in);
        inObject = objIn.readObject();
        objIn.close();
        if (inObject instanceof InObject){
            returnValue = executeCall((InObject)inObject, req);
        } else if (inObject instanceof MethodList){
            returnValue = executeMethods((MethodList)inObject, req);
        }
    } catch (InvocationTargetException ite) {
        returnValue = ite.getTargetException();
        context.log("InvocationTargetException", ite);
    } catch (RuntimeException re) {
        context.log("Null Pointer Exception", re);
    } catch (Exception ex) {
        returnValue = ex;
        context.log("Exception", ex);
    }
    if (returnValue == null){
        sendResultObject(res, new NullObject());
    }
}

```

```

    } else{
        try{
            sendResultObject(res, getReturnValue(returnValue));
        } catch(SQLException sqle){
            sendResultObject(res, sqle);
        }
    }
}
}

```

```

private String createConnection(InObject callObject, HttpServletRequest req) throws
SQLException, InvocationTargetException, NoSuchMethodException,
IllegalAccessException{
    Properties props = (Properties)callObject.parameters[1];
    java.sql.Connection con = DBConnectionFactory.createConnection(props);
    String connectionName = createObjectReference(callObject, con).toString();
    // setupConnectionTimeout(req, con, callObject.getSessionId()); // comment this line
    for local testing
    log("Connection Created");
    return connectionName;
}

```

```

private void setupConnectionTimeout(HttpServletRequest req, java.sql.Connection
connection, String sessionId){
    log("***** Setting up Connection Timeout
*****");
    HttpSession session = req.getSession();
    session.setAttribute(sessionId,new JDBCServerConnection(sessionId, connection,
getServletContext()));
}

```

```

private Object executeCall(InObject callObject, HttpServletRequest req) throws
SQLException, InvocationTargetException, NoSuchMethodException,
IllegalAccessException{
    Object obj = null, returnValue = null;
    JDBCServerSession serverSession =
(JDBCServerSession)sessions.getSession(callObject.getSessionId() );
    String objectName = callObject.getObjectNames();
    if (objectName.equals("driver") ) {
        returnValue = createConnection(callObject, req); // Currently this is called when
driver.connect() is called Need to implement other methods getMinorVersion etc. if
required.
    } else if (objectName.equals("connection") ) {
        obj = serverSession.getObject("connection");
        Object methodCallReturnObject = executeMethodOnObject(obj, callObject);
        returnValue = createObjectReference(callObject, methodCallReturnObject);
    }
}

```

```

    } else if (serverSession != null) {
        obj = serverSession.getObject(objectName);
        Object methodCallReturnObject = executeMethodOnObject(obj, callObject);
        returnValue = createObjectReference(callObject, methodCallReturnObject);
    }
    if (returnValue == null){
        return new NullObject();
    }
    return returnValue;
}

```

public Object executeMethods(MethodList methodList, HttpServletRequest req) throws
SQLException, InvocationTargetException, IllegalAccessException,
NoSuchMethodException{

```

    Iterator iterator = methodList.iterator();
    Object returnValue = null;
    Object objectToExecuteMethodsOn = null;
    String objectName = methodList.getName();
    while (iterator.hasNext()){
        InObject inObject = (InObject)iterator.next();
        try{
            if (objectName == null){
                objectName = (String)executeCall(inObject, req);
                methodList.setName(objectName);
            } else{
                inObject.objectName = objectName;
                objectToExecuteMethodsOn = getObjectByName(inObject);
                Object methodReturnValue =
                executeMethodOnObject(objectToExecuteMethodsOn, inObject);
                if (methodReturnValue != null){
                    returnValue = getReturnValue(methodReturnValue);
                }
            }
        } catch (NoSuchMethodException nsme){
            context.log("Exception : ",nsme);
        }
    }
    returnValue = getReturnValue(returnValue); // if the return value is a ResultSet then
    we need to create a cachedRowSet from that
    return new OutObject(objectName, returnValue);
}

```

```

private Object getReturnValue(Object returnValue) throws SQLException{
    if (returnValue == null){
        return new NullObject();
    }
}

```

```

if (returnValue instanceof ResultSet) {
    CachedRowSet crs = new CachedRowSet();
    crs.populate((ResultSet)returnValue);
    ResultSet rset = (ResultSet)returnValue;
    rset.close();
    return crs;
}
return returnValue;
}

```

```

private Object executeMethodOnObject(Object object, InObject inObject) throws
NoSuchMethodException, InvocationTargetException, IllegalAccessException {
    Object returnValue = null;
    if (inObject.getMethodName().equals("close") ) {
        JDBCServerSession session = sessions.getSession(inObject.getSessionId());
        session.closeObject(object, inObject.getObjectId());
        return new NullObject();
    }
    inObject.createInputStreamFromBytes();
    Class calledObjectClass = object.getClass();
    Class[] pmtypes = inObject.getParameterTypes();
    Method method = calledObjectClass.getMethod(inObject.getMethodName(),
pmtypes );
    returnValue = method.invoke(object, inObject.getParameters());
    return returnValue;
}

```

```

private Object executeMethodsOnObject(Iterator inObjects, Object
objectToExecuteMethodsOn) throws NoSuchMethodException,
InvocationTargetException, IllegalAccessException {
    Object returnValue = null;
    while (inObjects.hasNext()){
        InObject inObject = (InObject)inObjects.next();
        returnValue = executeMethodOnObject(objectToExecuteMethodsOn, inObject);
    }
    return returnValue;
}

```

```

private Object getObjectByName(InObject inObject){
    JDBCServerSession serverSession =
(JDBCServerSession)sessions.getSession(inObject.getSessionId());
    return serverSession.getObject(inObject.objectName);
}

```

```

private Object createObjectReference(InObject inObject, Object referenceObject)
throws SQLException, InvocationTargetException, IllegalAccessException {

```

```

        JDBCServerSession serverSession =
(JDBCServerSession)sessions.getSession(inObject.getSessionId());
        String methodName = inObject.getMethodName();
        if ( methodName.equals("createStatement") ||
methodName.equals("prepareStatement")
            || methodName.equals("prepareCall") || methodName.equals("getMetaData")
            || methodName.equals("connect")) {
            return serverSession.setObject(referenceObject);
        }
        return referenceObject;
    }
}

```

```

class Session implements HttpSessionBindingListener{
    private String id;
    private ServletContext context;
    public Session(String id, ServletContext context){
        this.id = id;
        this.context = context;
    }

    public void valueBound(HttpSessionBindingEvent e){
        // do nothing, cos we would just create the object
        context.log("***** Bound : "+id+" *****");
    }

    public void valueUnbound(HttpSessionBindingEvent e){
        // when the session dies, delete it from the hash table, and all the
        // objects owned by that session should theoretically die.
        // context.log("Unbound Session : "+id);
        context.log("***** Unbound : "+id+" *****");
        JDBCServlet.getServerSessions().disposeSession(id);
    }
}

```

Class Oracle.java

```
package com.VSDV.HTTPJDBC.Server;

import java.util.*;
import java.sql.*;

public class Oracle implements DBVendor{
    private final String dbDriver = "weblogic.jdbc20.oci.Driver";
    Properties properties;
    public Oracle(Properties properties) {
        this.properties = properties;
    }

    public Connection createConnectionFromProperties() throws SQLException{
        try{
            Driver driver = (Driver) Class.forName(dbDriver).newInstance();
            // for oracle oci connections the value of server should be one of
            // the tnsnames entries, but this will be the values of db parameter
            // so this needs to be changed and all we need
            // is user, password, server.
            Properties props = new Properties();
            props.put("user", properties.get("user"));
            props.put("password", properties.get("password"));
            props.put("server", properties.get("db"));
            Connection connection = driver.connect("jdbc20:weblogic:oracle", props);
            return connection;
        } catch(ClassNotFoundException cnfe){
            throw new SQLException("Fatal Error - Suitable driver class not found for Oracle");
        } catch(IllegalAccessException iae){
            throw new SQLException("Fatal Error - Illegal access exception while trying to load
driver for Oracle");
        } catch(InstantiationException ie){
            throw new SQLException("Fatal Error - Cannot instantiate driver for Oracle");
        }
    }
}
```

Class ServerSessions

```
package com.VSDV.HTTPJDBC.Server;

import java.util.*;
import java.awt.event.*;
import javax.swing.Timer;
import javax.servlet.*;

/**
 * Holds JDBCServerSession objects for the servlet
 */
public class ServerSessions {

    Hashtable hash;

    int counter=0;
    long time = System.currentTimeMillis();
    int secondsTillKill = 30;
    Timer timer;
    ServletContext context;

    public ServerSessions(ServletContext context) {
        this.context = context;
        hash = new Hashtable();
        // disabling sessions
        // timer = new Timer(1000*10, new TimerListener() );
        // timer.start();
    }

    /**
     * Periodically runs and cleans up session that
     * have not been renewed lately
     */
    public class TimerListener implements ActionListener {
        public void actionPerformed(ActionEvent evt) {
            try {
                disposeOldSessions();
            } catch (Exception ex) {
                ex.printStackTrace();
            }
        }
    }
}
```

```
}
```

```
public JDBCServerSession[] getSessions() {
    JDBCServerSession[] sessions = new JDBCServerSession[hash.size()];
    Enumeration enum = hash.elements();
    int count = 0;
    while (enum.hasMoreElements() ) {
        sessions[count] = (JDBCServerSession)enum.nextElement();
        count++;
    }
    return sessions;
}
```

```
/**
```

```
 * Tosses old sessions
```

```
 */
```

```
private void disposeOldSessions() {
    Enumeration enum = hash.keys();
    while (enum.hasMoreElements() ) {
        String key = (String)enum.nextElement();

        JDBCServerSession session = (JDBCServerSession)hash.get(key);
        long lastRenewed = session.getLastRenewed();
        long currentTime = System.currentTimeMillis();
        long difference = currentTime - lastRenewed;

        if ( difference > (1000*secondsTillKill) ) {
            hash.remove(key);
            session.close();
            // context.log("removed session "+key );
            // context.log("difference = "+ difference);
        }
    }
}
```

```
/**
```

```
 * Adds session to collection
```

```
 */
```

```
public String addSession(JDBCServerSession obj) {
    counter++;
    String sessionId = time+counter+"";
    hash.put(sessionId, obj);
    obj.setSessionId(sessionId);
    return sessionId;
}
```



```

/**
 * Get session out of collection based on the sessionId
 */
public JDBCServerSession getSession(String sessionId) {
    return (JDBCServerSession)hash.get(sessionId);
}

public void disposeSession(String sessionId){
    JDBCServerSession session = getSession(sessionId);
    // context.log("Closing off objects for session : "+sessionId);
    session.close();
    hash.remove(sessionId);
}
}

```

Class SQLServer

```
package com.VSDV.HTTPJDBC.Server;

import java.util.*;
import java.sql.*;

public class SQLServer implements DBVendor {
    private String driverClass = "weblogic.jdbc.mssqlserver4.Driver";
    private Properties properties;
    public SQLServer(Properties props) {
        this.properties = props;
    }

    public Connection createConnectionFromProperties() throws SQLException{
        try{
            Driver driver = (Driver) Class.forName(driverClass).newInstance();
            Connection connection = driver.connect("jdbc:weblogic:mssqlserver4", properties);
            return connection;
        } catch(ClassNotFoundException cnfe){
            throw new SQLException("Fatal Error - Suitable driver class not found for SQLServer");
        } catch(IllegalAccessException iae){
            throw new SQLException("Fatal Error - Illegal access exception while trying to load driver for
SQLServer");
        } catch(InstantiationException ie){
            throw new SQLException("Fatal Error - Cannot instantiate driver for SQLServer");
        }
    }
}
```